The Educational Research Bulletin

Vol. VI

1927

Published by

BUREAU OF EDUCATIONAL RESEARCH

COLLEGE OF EDUCATION THE OHIO STATE UNIVERSITY

COLUMBUS, OHIO

LIBRARIAN
UNIVERSITY OF MICHIGAN
ANN ARBOR, MICH.

JAN 14 1927

L
11
.E3

Educational Research Bulletin

(Registered in United States Patent Office)

Vol. VI JANUARY 5, 1927 Number 1

TABLE OF CONTENTS

Arithmetic at the Crossroads.....*B. R. Buckingham* 1

Bureaus of Educational Research in the United States, *H. B. Chapman* 7

Editorial Comment;
The School Dollar..... 10

The Denver Course of Study for the Elementary School, *O. G. Brim* 12

The Denver Course of Study in Secondary School, *V. T. Thayer* 17

Educational Readings..... 19

New Tests..... 22

THE OHIO STATE UNIVERSITY
COLLEGE OF EDUCATION
GEORGE F. ARPS, *Dean*

SEVEN years ago the First Annual Ohio State Educational Conference was in the making. This was the beginning of a state institution which asserted its significance at the very start. Designed primarily to promote the educational welfare of the state, it has been successful not only in accomplishing this end, but, in addition, has, at the same time, acquired a national character. The quality, and indeed the number, of the speakers, as well as the broad scope of the Conference programs, have made for this success.

This year the Seventh Annual Ohio State Educational Conference bids fair to exceed in educational service those of past years. One new section has been added to the twenty-nine which were provided for last year; speakers of national and international reputation will appear on both the general and sectional programs; and the educational leaders of Ohio are, as usual, evincing a genuine interest in the program of the Conference. The Seventh Annual Ohio State Educational Conference will, in short, place at the disposal of the school people of Ohio a fund of educational experience, knowledge, and service during the three days of its 1927 Conference.

At Columbus, April 7, 8, 9 *Reserve the dates*

Published fortnightly, except during June, July, and August, with but one issue in December, by the Bureau of Educational Research, Ohio State University.

Entered as Second-Class Matter, February 9, 1922, at the Post-Office at Columbus, Ohio, under the Act of August 24, 1912. Accepted for mailing at specified rates of postage provided for in Section 1103, Act of October 3, 1917, authorized February 21, 1922.

General

Educational Research Bulletin

ARITHMETIC AT THE CROSSROADS

B. R. Buckingham
Ohio State University

By the title given this article,[1] I do not mean that arithmetic is on the point of going to the dogs unless heroic measures are taken to rescue it. I simply mean that the subject, as it is embodied in courses of study and as it is presented in the classroom, has reached a sharp turn in the path it should take. Not long ago I heard an eminent educational thinker declare that, while geography, history, reading, and some other school subjects might be discussed and improved by teachers and textbook writers, about the last word had been said with respect to arithmetic. Nothing could be further from the truth. After even superficial consideration it will be apparent that in a thousand ways arithmetic may be improved either as to its subject-matter or as to its manner of teaching.

Let us confine ourselves to the primary field for purposes of simplification. Since an attempt to give details for the upper grades would involve more than you would care to read, I shall emphasize some of the aspects in which content and method may be improved in teaching arithmetic to little children.

When the child comes to school he already knows something about numbers; just how much he knows is one of the things *we* ought to know. The researches of Hall, Yoakum, Binet, and Thorndike lead us to believe that quite three-fourths of the pupils who enter school at the age of six can count to ten. Indeed, one of the items in the Binet Test (Stanford revision) for six-year-old children is the counting of thirteen pennies, once in two trials. There is also reason to believe that at this age children can tell either by inspection or by counting how many objects there are in groups of *two*, *three*, and *four*, but, as I have intimated, a competent investigation of the number abilities of six-year-old children in contemporary American society is greatly to be desired. Moreover, we need a technique and an instrument—a method and a test—for taking an inventory of the abilities of children as they enter school.

There is much lost motion here. Thousands of children come to school able to count to one hundred, to tell the "how many" of a group of objects as large as ten, to use the ideas, one-half and one-quarter, to tell time, and to do various things which we laboriously "teach" them after they enter school. What a waste of time, and more than that, what a waste of interest. Only in one other subject are the sins of the school greater in this respect, and that is reading. We quite commonly take children from good homes who can already read with some enjoyment and subject them to a dreary round of technical drill. You can easily imagine the stultifying effect of the school's assumption that all

[1]Printed also in *Twenty Grades* for January, 1927.

children are equally without information when they enter school. This assumption is crude, heartless, and false.

Some time after the child has entered school—in some districts in the first grade and in others not until the second—we teach him the fundamental facts of addition and subtraction. At this point much uncertainty exists. The commonest practice is to teach the addition facts in a logical order. We begin with $1 + 1$ and follow with $2 + 1$, $3 + 1$, $4 + 1$, and inexorably pursue the ones up to $9 + 1$. Then we take the twos and threes; and in this sequence we carry the matter through until we ultimately reach $9 + 9$. The scheme is beautifully logical and, from an adult point of view, highly satisfactory.

It transpires, however, that the child gets his number facts in a manner which suggests counting. The answer to each of the first facts he learns is one more than the preceding number. The key to the next group is "two more," to the next group "three more," and so on. Here we set up at the outset a bad habit. We want the child to know $4 + 5 = 9$ as a fact; we want him to respond to $6 + 5$ as unerringly as we expect him to respond to the word form "dog." We do not expect or desire him to spell dog before being able to apprehend it. The same attitude should be maintained with respect to the number combinations. The child who must respond to "six and three" by counting "seven, eight, nine" is handicapped from the start.

This suggests a pied order of presenting the number facts, but this is not enough. We now know a great deal—in fact all that is really necessary for teaching purposes—about the difficulty of these facts. We know that $5 + 5$ and $2 + 2$ are about the easiest of the addition facts; and that $5 + 8$ and $7 + 9$ are about the hardest. Between these extremes there is every gradation in difficulty. Undoubtedly this fact has some bearing upon the order in which the number combinations should be taught.

The difficulty of the number facts, however, is not the only criterion to use in establishing a teaching order. There are interferences among these number facts; identical elements are confusing. If we teach $4 + 3 = 7$ in close connection with $4 + 5 = 9$, we run the risk of an interchange of the responses "seven" and "nine" with the result that some children will say $4 + 5 = 7$ or $4 + 3 = 9$. We do not know much about the conditions of interference and of facilitation in learning. The whole subject needs the support of careful experimental data. In the absence of such data, however, it seems best to avoid the consecutive presentation of combinations which have common terms in the then stimulus part. Doubtless, this is one of the reasons why the so-called logical order of presenting the addition combinations is so unsatisfactory. If $3 + 2$, $4 + 2$, $5 + 2$, $6 + 2$, and $7 + 2$ are taught in that order, it is almost certain that the children will attach some of the responses five, six, seven, eight, and nine to the wrong stimuli. Their only recourse under these circumstances is to count. Moreover, by this means an illusory appearance of mastery is created. The child appears to have learned several facts in a very short time when, in reality, he may have mastered none. Accordingly, I suggest that, in the absence of contrary evidence, we adopt an order of teaching the number facts which exemplifies the application of two principles, namely, the order of difficulty and the avoidance of common elements.

How many addition facts should we teach? It is not unusual to say that there are forty-five of them, as a matter of fact there are one hundred. The "forty-five combinations" assumes, in the first place, that the order of the addends is immaterial, in other words, that $6 + 4$ and $4 + 6$ are *the same com-*

bination. If this were true the difficulty of $6 + 4$ and $4 + 6$ would be substantially the same. Yet Clapp found that twice as many children got the wrong answer to $4 + 6$ as got the wrong answer to $6 + 4$. As I interpret the findings, there is a tendency for direct and reverse addition combinations to resemble each other in difficulty; but the difficulties are by no means identical, and they fail entirely to support the view that, when a given fact has been taught in its direct form, its reverse does not need to be taught.

In the second place, the assumption of forty-five addition combinations leaves out of account the nineteen facts involving zero. The zeros are troublesome, although they are less so in addition than they are in the other operations, yet even in addition the zero must receive attention. If we limit ourselves to forty-five combinations, thereby leaving the zeros wholly out of account, our pupils certainly will have trouble with such addition examples as these:

705	45	8	806
20	207	300	907
—	—	—	—.

Early in the teaching of primary arithmetic the teacher must decide whether to present the addition and subtraction facts together or separately, whether to teach all the addition facts before any of the subtraction facts, or whether to teach the addition facts along with the subtraction facts which correspond to them. No one to my knowledge has published an investigation of this matter; some good teachers follow one method while other teachers equally good follow the other. My own investigations, limited and crude though they are, lend support to the "together" rather than the "separate" method. I had this matter tried out last year in six different schools. Each class was divided on the basis of a preliminary test into two equal-ability groups. One group was then taught a definite number of addition and subtraction facts by the together method, while the other was taught the same facts by the separate method. The amount of teaching and drill, and in fact all the factors thought to be likely to influence the achievement of the children, were presumed to be kept equal for the two groups. In five of the six centers the together method yielded better results than the separate method.

We know little about interferences and facilitations in learning. The fact, however, that there is a tendency for direct and reverse addition combinations to approach each other in difficulty and the fact, that evidence supports the teaching of related addition and subtraction combinations together, strongly suggest that, if we group the four related addition and subtraction combinations together into a teaching unit we shall be facilitating the learning of these combinations. Consider, for example, the addition fact $2 + 6 = 8$. The grouping which I am suggesting will lead us to combine into one teaching unit the four facts: $2+6=8$, $6+2=8$, $8-2=6$, and $8-6=2$. It appears that when so grouped these facts lend support to each other. There is a certain plausibility in this; and, although plausibility is a dangerous test of the workability of a scheme, it offers a basis for the formulation of a scientific hypothesis.

Does it not seem reasonable that, when we have set up in front of a class the objective material for teaching $2 + 6 = 8$, we may with economy of effort and with facilitation of learning use the same material to show that $6 + 2 = 8$, that $8 - 2 = 6$, and that $8 - 6 = 2$? We have eight things before us. Perhaps they are children brought up to the front of the room. We have separated them into two groups, one of two and the other of six, and we have called attention to the fact that there are eight children in the entire

group. On the one hand, we may start with the two children and combine the six children with them to obtain eight children. On the other hand, we may start with the six children and unite the two children with them to obtain the same result. Moreover, we may have two of the eight children leave the room or hide behind the teacher's desk leaving a visible remainder of six children. Finally, we may withdraw six and show that there are two left. Again, in our drill we may have the children "tell the whole story." When they say "2 plus 6 are 8," they may, at times, be expected to say the other three related facts, namely, "6 plus 2 are 8, 8 less 2 are 6, 8 less 6 are 2."

How shall we teach the subtraction facts? Shall we teach them according to the take-away idea, or shall we teach them additively? As you may have gathered from the previous paragraph, I favor the take-away method. I shall take a little space here to give my reasons, but first let us be sure that we understand the two procedures.

If you teach subtraction by the additive method you introduce in connection with the combination, $2 + 6 = 8$, the question, together with its corresponding reply, "Two and how many are eight?" When the pupil answers "six," he is held to have subtracted by the additive method. There is no assurance that he has thought anything about subtraction. Perhaps he should not do so. Perhaps the strength of the additive method is unaffected by the fact that no subtraction idea is introduced at all. To the child at this point the question and its answer may be only another way of getting at the same addition fact which he has already learned. We ask him, "Two and six are how many?" He answers, "Two and six are eight." He is then held to have stated an *addition* fact. We ask him, "Two and how many are eight?" His reply is identical with his reply to the first question. It is, "Two and six are eight," yet the child is held in this instance to have stated a subtraction fact. As I have said, unless the teacher labels these responses and calls for an oral emphasis in making them, the pupil is unlikely to consider himself outside of the realm of addition.

On the other hand, if you teach subtraction by the take-away method, besides teaching the fact, 2 and 6 are 8, you will also teach the fact, 8 less 2 are 6. This is indeed a subtraction fact, thought of as such. It represents, as subtraction should from its fundamental meaning, a withdrawing or taking away of a part from a whole and the fact that the other part remains.

It is my belief that this idea is too useful and too common to be left out of account in school work. In the first place, the world thinks of subtraction as a take-away process, as a withdrawal, as a deduction from a larger to a smaller amount. Trade discount is identified with subtraction. It is an amount taken from the list price. One does not think of it—although it is admitted that one could—as the amount by which the list price exceeds the net price. Far less does one think of it as an amount added to the net price to produce the list price. The discount is an amount saved; and one who secures an overcoat marked down from $40 to $32 invariably figures how much *less* he paid by purchasing at $32 rather than how much *more* he would have paid if he had purchased at $40. Depreciation of a building or of equipment is regarded as a decrease from original value, not an increase over present value. Losses in business are thought of as deductions from cost, not as amounts added to receipts. If the additive method of subtraction is to prevail, it must work over into the thinking of the people. As things now are, their forms of thought on many matters are subtractive rather than additive.

In the second place, our pupils live in a school world adjusted to the subtractive rather than the additive idea of subtraction. Throughout the course of study there are many places where either the take-away or the additive idea must be adopted. In most of these instances, no matter what the early treatment of the subject may have been, the decision is in favor of the take-away idea. No matter whether, in the first and second grades, the subtraction combinations were taught by the additive or the take-away method, the take-away method for the most part prevails in later work. Without doubt, all work in arithmetic, and in algebra, too, could be adjusted to the additive idea. Such an adjustment has never been made, and, in our opinion, it is largely because of this fact that the take-away method scores its victory.

It sometimes happens, for example, that a pupil is taught the combinations by the additive process, and is afterwards required to explain "long" subtraction by the take-away method, but the real objection to the additive method of subtraction lies further on in the course of study. It lies in the inconsistent teaching of division and of the subtraction of fractions and denominate numbers. The additive method of subtraction needs no justification in theory, but, before it can be a real success in practice, it must be carried out consistently. This no one is at present ready to do.

Much is made in modern writings about arithmetic of the value of checking one's work. Consider the following subtraction example (I have freed it from carrying difficulties because these have no bearing on the present point):

$$\begin{array}{r} 678 \\ 432 \\ \hline 246 \end{array}$$

If the child has been taught additive subtraction, he is supposed to think: "2 and 6 are 8, write 6; 3 and 4 are 7, write 4; 4 and 2 are 6, write 2." If he is called upon to check his work by the usual process of adding the remainder to the subtrahend, he will now think, if he adds downward, 2 and 6 are 8; 3 and 4 are 7; 4 and 2 are 6. This is precisely the operation he performed in subtracting, and obviously there is no check involved except that of doing the work a second time. Even if he adds upward and thinks "6 and 2 are 8," etc., he will be using merely the reverse of the addition facts he has already employed. The advantage of a check by another operation is lost. If the pupil who has been taught take-away subtraction does the above example he will think, "8 less 2 are 6," etc., and may check his work by a different operation, namely, addition.

It is said that the teaching of additive subtraction fortifies the learning of the facts of addition. It is held, for example, that when we place before the child the form, $2 + ? = 8$, we are strengthening the grasp of the addition fact, $2 + 6 = 8$. This is undoubtedly true, but it is proper to reply that this technique should be employed whether we teach additive subtraction or not. It should be used as a means of practicing the addition fact in question without any reference whatever to subtraction. Moreover, when it is so used—that is, when forms like $2 + ? = 8$ are employed in our attack upon addition—it is not too much to suppose that we are supporting and facilitating subtraction taught as a take-away process.

All this, you will say, is theoretical—an adult's everlasting projection of his own ideas into the child's world. What, you will ask, is the experimental evidence on the question. Alas! the evidence is indeed meager. Few persons have thought that the many questions of method in primary arithmetic were worth experimental approach. Nevertheless, I have done something to

investigate the point at issue. Four schools have lately conducted controlled experiments in the teaching of additive and take-away subtraction. The classes were again separated into two equal-ability groups in an attempt to stabilize or allow for disturbing influences. In three of the four schools the take-away method proved to be superior to the additive method.

There are a great many other points both of method and of material which the modern teaching of arithmetic should embody. A stand, one way or the other, should be taken on the question of the borrowing and the equal-additions method of subtracting. Upon investigation it may very well turn out that neither method is significantly superior to the other. Even if this is the case the present "straddle" should not be continued. Our schools are full of children and our homes and occupations are full of adults who have been taught both ways to their utter confusion.

Just as the question of teaching the basic addition and subtraction facts together or separately is an issue, so the separate and together methods in respect to multiplication and division facts must receive attention. As far as my own study of the question goes there is little to choose, but my data are so meager that I am by no means sure.

When you add a column of figures do you go up or down? Three out of five of the teachers and students of whom I have asked this question add upward. They testify that they do this to a large extent because they were taught that way in school. On the other hand, the people who add downward appear to have adopted this procedure independently, frequently abandoning the way they were taught. There are apparently cogent arguments for the downward process. It involves fewer eye- and hand-movements, especially when the number to be carried is written at the top of the "next" column.

All such arguments, however, would have to yield if experimental data contradicted them. One experiment already published shows that the downward process is somewhat more accurate but slower. I have tried the rival methods in several schools. I find that in five out of six schools in which the experiment was conducted, downward addition yielded the greater degree of accuracy. I did not, however, take account of speed.[1]

Space prevents my going on with the items to which we should give attention in the teaching of primary arithmetic. In conclusion, I want to say that all the items I have mentioned and others of the same nature might be taken care of with infinitely scientific precision, yet we might have a course of study or a textbook or a teacher as uninspiring as a stick of wood. Unless we can infuse into our teaching of arithmetic some of the human interest by which it may be characterized, the discovery of a scientifically defensible method will be relatively unimportant.

"The world is so full of a number of things," and all these things, in the Thorndikian phrase, "exist in some amount." The conditions of life—even of child life—involve quantity, comparison, measurement, counting, and the combination of number with number. Yet so little of it gets into our teaching of arithmetic in a vital way!

I suppose that no arithmetic textbook that has appeared in the last decade has failed to claim for itself that its problems represented life conditions and appealed to children's interests. As an ideal this is fine, but in accomplishment it leaves much to be desired. I have yet to become acquainted with a textbook which I thought children would read on their own account. I never knew a child to take his arithmetic home when he did not have to.

[1]Buckingham, B. R. "Adding Up or Down: A Discussion," *Journal of Educational Research*, 12:251-61, November, 1925.

It seems to me, therefore, that something like the same thing will have to be done for arithmetic that has been done for reading. If the entire reading program of this day and age is more interesting, more human, more worth while than the reading program to which our fathers were subjected, if it is true that third-grade children in progressive schools now read as well as eighth-grade children used to read, if a dozen or fifteen books are now read in each of the primary grades where one was stumbled through in the past—if these accomplishments of the school may be recorded in the field of reading, why may we not work for a similar advance in a field so essential and, I should like to add, so fascinating, as arithmetic?

BUREAUS OF EDUCATIONAL RESEARCH IN THE UNITED STATES

H. B. CHAPMAN
Bureau of Research, Baltimore Public Schools

ONE of the most extensive of the projects completed by the Bureau of Educational Research at the Ohio State University during 1926 was an investigation of the inception, articulation, and functions of bureaus of educational research. Under the general heading "bureaus of research" were included all those bureaus, divisions, and departments in city school systems and other educational institutions whose main *raison d'être* was the scientific study and analysis of educational methods and results. The published report of this study will soon be available.[1]

The report will bring together a vast amount of data upon the inception and early history of research bureaus. It will describe their working articulation with the more usual forms of educational organizations and will enumerate their activities and some of the more important techniques developed by them in the performance of certain of their functions. In addition to the data which will be contained in the published report, other phases of the evolution and work of research bureaus will be presented in a series of forthcoming articles in the EDUCATIONAL RESEARCH BULLETIN.

Research bureaus, despite extreme variations in activities and in titles, present at least three common factors: they are organizations set up specifically for the study of administrative and instructional problems; they have their own directors and staffs; they are made directly responsible to the chief officers of the respective educational organizations of which they are a part. Bureaus of research are now found in practically every field of educational endeavor.

In city school systems, the research bureaus range from mere testing organizations to agencies devoted exclusively to the scientific study of the problems of administration and instruction characteristic of large cities. They are called upon, in many cities, to exercise functions which are not properly research, but involve the application of research findings. In this group may be classed the organization and administration of educational- and vocational-guidance programs, the organization and

[1] Chapman, H. B. "Organized Research in Education with Special Reference to the Bureau of Educational Research." To be published as one of the "Ohio State University Studies, Bureau of Educational Research Monographs."

direction of special classes, the examination of prospective teachers, publicity service, and other administrative duties of special local significance. Functions of this kind have laid a number of bureaus open to the charge of being "service" rather than "research" bureaus. San Francisco has given recognition to these functions as necessary and desirable adjuncts to other research activities, and frankly calls its organization a "Service Division."

The bureaus, in some cities, notably Rochester and Minneapolis, have become largely agencies for coordinating the research activities of other units of the school system. As the skills requisite for research become more generally acquired, and the experimental attitude more widely cultivated, the greater is the need of an organization to direct this desirable activity into profitable and productive channels and to bring it to fruition. In Rochester, this program has resulted, among other things, in a series of monographs which have served to replace the old annual report.

Research bureaus in institutions, colleges of education, and state educational departments and the like, exhibit a much greater variety than do research bureaus in cities. At Teachers College, Columbia University, the Institute of Educational Research is concerned exclusively with pure research. When it has a problem which it wishes to investigate, its policy is to engage the best man that can be secured and to place at his disposal all of the resources which are needed for the effective investigation of that problem. In general, the Institute is primarily concerned with problems of experimental and applied learning.

On the other hand, the Division of Educational Reference, at Purdue University, has been organized primarily for the purpose of subjecting to scientific investigation the problems involved in the administration of a great university. The Division is not concerned with pure research or with the investigation of problems in the subject-matter fields. Its chief objective is a more efficiently administered university made so by the application of research techniques.

These bureaus, however, represent extremes. Most of the bureaus in higher institutions of learning are not only concerned with problems of administration and instruction, but also with the promotion of research undertakings by school men in the field. They also serve as centers of leadership and of expert advice to which the educators of the state feel free to turn for assistance.

Ten states now have some form of research bureau in their education departments, although the character of the work undertaken varies widely. The Wisconsin and New York bureaus hold practically the same relation to the state at large as do the bureaus in the state universities of the Middle West. The bureaus in other states are more limited in their scope. During the past five years the General Education Board has been active in aiding states to establish research bureaus, and this assistance has given a great impetus to the movement. Of the ten state bureaus, six owe their inception very largely to this source.

On the national level, the Research Division of the National Education Association is assuming a rapidly increasing importance. The use of comparative statistics has created a need for an agency which is equipped to assemble data from large areas, and to make studies on a nation-wide basis. Both the Research Division and the United States Bureau of Education have thus become important factors in the promotion and execution of studies involving larger units.

Separate agencies have been incorporated for the purpose of intensive investigations in special fields, in addition to the bureaus associated with the customary forms of educational organiza-

tions. The Personnel Research Federation, for example, was incorporated by a group of higher educational institutions and industrial concerns for research in the field of personnel management, a special subdivision of educational research. The Ohio Institute engages in a certain amount of research in education as a part of the civic organization of the state. The Bureau of Educational Experiments studies the psychological aspects of learning in young children and the organization of school life in accordance with its experimental findings in such a way as to produce the best results.

Research in education as a corporate movement is very diversified in organization and scope. This is due, in part, to the broad reaches which may be included under the term research. In part, also, this is due to the essentially local character of the movement. Research organizations have been set up to do specific tasks. It is the exceptional bureau which has been given *carte blanche* authority to proceed to the investigation of abstract problems in education that exist entirely apart from any local bearing.

This condition is not an unmixed evil, for while no one would for a moment deny the value of pure research in the promotion of educational progress, the necessity of showing tangible results has compelled the movement to maintain a pragmatic point of view from the start. Therein rests the soundness of organized research in education.

Principal Neil D. Mathews, of West Commerce High School, Cleveland, has sent in the schedule of the faculty meetings for the year. Each meeting is to be arranged by a committee of teachers, having from one to five members; and every teacher has been assigned work on one of these committees. The schedule of topics for the year is:

October 13—
"The Value of a School Placement Bureau in Guidance and Curriculum Revision," Mr. Jones

October 27—
"A Comparison of the Success of Pupils Entering High School in February and in September," Mr. Hoover

November 17—
"The Distribution of Pupils' Study Time among the Various School Subjects," Miss Dugan. Mr. Hess, and Miss Albaugh

December 1—
"Study Helps for Pupils," Mr. McMyler, Miss Stanford, and Miss L. Smith

December 15—
"The Effects of Outside Work on the Kind and Amount of School Work Done by Pupils," Mr. Hines, Mr. Creig, and Miss Franks

January 5—
"Use of the School Library and Achievement in Various Subjects," Miss N. Jones, Miss Currin, and Mr. Hottell

January 19—
"The Activities Period in the School Day," Mr. Stokes, Miss Jackson, and Mr. Elliot

February 16—
"The Relation of Probable Learning Rates to Favorite Subjects and Occupational Choices," Mr. Aseltine, Miss Snyder, and Mr. Gephart

March 2—
"A Comparison of Probable Learning Rates and Achievement in Various Subjects," Mr. B. Smith, Mr. Curry, and Miss Foster

March 16—
"A Comparison of Achievement in English and Other School Subjects of Pupils from English Speaking and Non-English Speaking Homes," Miss Ward, Mr. Shuman, and Miss Colvin

March 30—
"The Effect of High-School Training on the Voluntary Reading of Pupils," Miss Grant, Miss Winters, Miss Triestor, and Mr. Hartzell

April 20—
"An Analysis of the Holding Power of Cleveland Senior High Schools," Mr. Hinkey, Mr. Harsh, and Miss Gombert

May 4—
"The Relation of Pupil Health to Learning," Miss Schroeder, Miss Krumhar, Mr. Bailey, and Mr. Dutton

May 18—
"A Self-Rating Scale for West Commerce Teachers," Miss Reames, Miss Brewer, Mr. Rayman, Miss Fredericksen, and Miss Cutright

June 1—
"Summary of the Accomplishments of West Commerce during 1926–27 with Suggestions for Improvement Next Year," Miss Ely, Mr. Benadum, Miss Hazelton, and Mr. Gordon.

Ohio State University

Educational Research Bulletin

Published fortnightly, except during June, July, and August, with but one issue in December, for the schools of Ohio by the Bureau of Educational Research, College of Education, The Ohio State University, Columbus.

B. R. BUCKINGHAM . . . . *Editor*
JOSEPHINE MACLATCHY . *Assistant Editor*

Address all communications to the
BUREAU OF EDUCATIONAL RESEARCH
Ohio State University, Columbus, Ohio

THE SCHOOL DOLLAR

THE holiday season is over and everyone is slowly coming back to the regular mode of living and the daily problems of home, school, and vocational life. After an orgy of spending, intensified by every element of the advertiser's art, those who must earn, are likely to note the obligations accumulated and the flattened purse, and feel inclined to be as penurious as they had been liberal. The Christmas spirit is frequently replaced by a feeling of resentment against taxes and the institutions which these taxes support. The sentiment widely prevails that, had taxes not taken such a heavy toll, the holiday expenses could be borne without serious inconvenience.

Our newspapers occasionally carry news articles and editorials pointing out the large indebtedness and heavy expenses of our public schools. At no time are such statements less likely to be sanely balanced than now nor the effects on taxpayers more potent. We have no desire that any facts regarding the public schools shall be hidden from the public which supports them. In fact, we permit no one to be more zealous in the advocacy of publicity, but we want the people to have all the facts and not simply a part of them. We want them to know and understand not only what the school indebtedness is but the amount of each indebtedness for which we pay taxes; not only the increase but the cause of the increase; not only the gross expenditures but the sources of revenue and the return which the schools make for the money expended.

No school administrator nor school board can justify undue expenditure of school funds, nor can any other official justify a superfluous spending of any other public fund. It is questionable whether we can justify extravagance in the use of our own incomes. Extravagance, however, is not proved by the mere fact of increase of gross expenditures or the increase of indebtedness. Neither is it defined in that manner. Of course, if education is to be described in terms of the usual activities of the school of a generation or two ago, then many things, we are doing in the schools today and the equipment needed for these activities, are luxuries and probably extravagances. If homes are to be measured in the same way, then bathrooms and furnaces, running water and electric lights all probably fall in this luxury class. Public institutions, as well as private modes of living, must be interpreted according to ideals, standards, and functions of the present.

Children have no direct voice and frequently very little influence, direct or indirect, upon matters which most vitally concern them. Taxation and the purposes for which taxes are expended are cases in point. It is therefore especially important that the school, the one institution specifically charged with the care and culture of childhood, should safeguard their interests on all occasions. Perhaps the best way in which this can be done is by seeing that every expenditure has a sound educational justification and that the public is given all the facts relative to public indebtedness, taxation, and expenditure.

An illustration of this partial information could be gleaned almost daily from the news columns or editorial pages of our

papers. The following quotation is taken from a recent editorial in an Ohio city paper: "During the period from 1910 to 1925 school indebtedness in this city increased about 1000 percent. . . . . Neither the increase in school enrollment nor in population has kept pace with these mounting debts." No reason is given but the inference is clear that these two factors, which fail to explain the situation, are the factors which should or should not justify the increase. Private individuals and corporations have been known to increase their indebtedness 1000 percent and more in much less time than fifteen years. Is it reprehensible? Is it extravagance? Is it luxury? Not at all. The percent of increased indebtedness simply does not tell the whole story. When applied to the school situation, it disposes the unthinking and the selfish to endeavor to curtail educational expenditures, however much needed.

Let us, by all means, have the most careful scrutiny of school expenditures and all expenditures. Let us give publicity to the facts regarding education by every means possible to all concerned and let us see all the facts given—not simply a part—especially at this season when the financial nerve is likely to be supersensitive. E. J. A.

Superintendent Bear of Miamisburg has drawn the editor's attention to an error in a quotation from the *Ohio School Law* given in the article by Mr. Whitmer and others, entitled "The Steps Required in Issuing Bonds for Completing School Building Programs in Ohio," which appeared in the issue of this Bulletin dated September 8. The last sentence under Section VI, on page 256, at present reads: "This must be done not more than fifty days prior to the November election," it should read: "This must be done more than fifty days prior to the November election."

THE research worker in the field of education is no longer overwhelmed by the mere magnitude of his task. Bolder and broader researches and experiments are being conceived and carried out with the patience and breadth of vision which have long characterized the seeker in physical science.

One such project is the study of the curriculum which is being carried on by the Bureau of Curriculum Research at Teachers College. The first available report of this investigation presents the results of a preliminary study of nine thousand courses of study made by 121 judges.[1] The criteria for judging the courses were set up by listing the points of strength and weakness of 468 courses of study. A total of 1,713 specific points was enumerated which were subjected to various tests and were critically reviewed by members of the faculty of Teachers College, before they were drafted in final form.

With the criteria thus established as a guide, the 121 judges evaluated the courses of study. Their ratings were then compared statistically. A high correlation was found between the rankings of groups of judges and a relatively low variation in the ranks assigned to the same courses of study by different judges.

The majority of the judges were graduate students at Teachers College; they represented, geographically, all sections of the country, the territorial possessions, and three foreign countries. They came from many different educational institutions and had had a median experience of 14.5 years in educational work.

The study will contribute to the solution of the baffling problems of curriculum construction. Two of the outstanding merits of the study are its

[1]Stratemeyer, Florence B. and Bruner, H. B. *Rating Elementary Courses of Study.* New York, Bureau of Publications, Teachers College, Columbia University, 1926. 193 pp.

inclusiveness and the type of criteria used, for these latter are derived from the best practice, and not from the indefinite ideals of any single school of curriculum constructionists.

Those who are working at curriculum revision will appreciate the list of courses which most nearly conform to the best points of the criteria. These are listed alphabetically under each of the elementary-school subjects. Those adjudged best are starred, so that one can easily determine the half-dozen best in any subject. By obtaining these courses of study and comparing them, the work of curriculum revision in any community should be materially lessened, and the ultimate product considerably improved.

THE DENVER COURSE OF STUDY FOR THE ELEMENTARY SCHOOL

O. G. BRIM
Ohio State University

THE program for curricular revision in Denver has attracted the attention of educators throughout the country. The time taken and money spent have indicated that the leaders considered this a problem of first magnitude. The professional spirit of its leadership, the extensive organization to secure maximum participation by the teaching and supervisory staff, and the provision for advice and counsel of experts promised a product of merit. The writer has examined three of the monographs for the elementary school, *Arithmetic*, *Elementary Language*, and *Social Science*. They are a distinct contribution to our curricular material.

The most unique departure from current practice is the monograph for the social sciences. Those responsible for it have dared to break away from the civics-history-geography classification in favor of a unified course and in so doing have achieved a product of distinction.

Only a few of the novel elements can be mentioned. Major topics are assigned to the different grades:

I. Home Life
II. Community Life
III-B. Indian Life
III-A. Child Life in Foreign Lands
IV-B. Colonial Life
IV-A. Westward Movement
V. Agriculture, Irrigation, Stock Raising, Fishing, Lumbering, Quarrying, and Mining
VI. Manufacturing, Transportation, Communication, Inventions and Discoveries, and Recreation

These headings seem in large measure to ignore the usual sort of material in history and geography. In fact one must seek to find it. Some of it one will never find and in this lies one of the monograph's greatest virtues, for war, political parties, dates, and geographical detail, as such, get scant attention.

What is included is experienced by the child in a new and more meaningful setting, because the work is organized entirely about problems. Under the topic assigned to each grade, minor problems are suggested and developed at great length. In connection with each, abundant and specific page references are given. Among these topics the teacher is urged to choose according to the interests and needs of her students. The length of time to be spent upon any one and the particular sequence of problems are not determined. "The selection of the project—its time and method of introduction, its duration, extent, and organization—are left to the judgment of the teacher and his supervisor."

Such a program throws an unusual responsibility upon the teacher. In doing this for a school system as large as Denver with all the chances for disorganization involved, the administration has shown faith and courage for which it is to be commended. Somewhat as a guide to the teacher, however, considerable space is given to general instructions which present the organizing principles. Moreover, before the assignment for each grade, one finds a lengthy list of objectives classified under appreciations and attitudes, habits and skills, and knowledge and information. At the close of each grade is given a "Checking List for Fact Basis" classified under geography, history, and civics.

In working out such a novel scheme as this, it is to be expected that some questionable features will have crept in. Of course, one may question the organization upon the problem basis. One may question the limited guidance and the extreme freedom of the teacher, the distribution of topics through the grades, the uncertain time given to each, and the like. Or, if one believes whole-heartedly in a project curriculum, one might criticise them for a too greatly predetermined outline. However, the course seems, to the writer, to have reached a happy practical balance.

Certain weaknesses appear, among the assignments to the grades, in the attempt to parcel out the formation of character traits, so intimately involved in the social studies. Character does not grow by the periodic addition of certain general traits at predetermined moments. For instance, the statement of the specific grade objectives for the fifth and sixth grades is: "To increase the child's acquaintance with the social and industrial progress of this city, country, and the world, *that he may more intelligently solve the problems of his own life.*"[1] In a project curriculum this conception is basic. It should pervade teaching upon every level. In this monograph this intimate relation of learning to living is an objective for the fifth and sixth grades only.

Again, reading the more detailed objectives for the several grades, one finds reason to wonder at the classification. For Grade I-B we find as a specific objective, "Habit of being polite in home and school."[2] For Grade I-A we find "Habit of being courteous;"[3] in Grade I-B, "Appreciation of fair dealing;" and in Grade I-A, "Attitude of being a good loser." One must develop such attitudes when occasions are propitious. Time and place cannot be arbitrarily specified for them, as if one were dealing with a list of arithmetical skills or words to spell. Moreover, they will not be accomplished in any one grade. Constant attention is the price of success in establishing character traits. In thus attempting to supply specific grade objectives, a present tendency is uncritically followed.

The monograph, *Elementary Language*, while not such a radical departure from curricular practice as is that for the social studies, is nevertheless a distinct achievement. A noteworthy and fundamentally significant attitude is displayed in the attempt to make school life such a vital, rich, and socialized experience that the child may find abundant occasion for the use of oral and written language in natural life situations. To assume such an attitude and to work for such a school must produce in time a very different institution indeed.

To do this three fundamental changes in the present school practice are necessary, and while they are not specifically mentioned in the booklet as conditions to be sought, they are implied in the general spirit expressed in the course of study and in the plans for detailed work.

[1] Denver, Colorado. *Social Science.* (Grades I, II, III, IV, V, and VI), Denver, Colorado, Public Schools, 1926, p. 10 (Course of Study Monograph, No. 20). Italics were inserted by present writer.

[2] *Ibid.*, p. 15.

[3] *Ibid.*, p. 25.

They are (1) a provision of topics, problems, and subject-matter challenging to the child, (2) a classroom teacher-pupil atmosphere inviting and encouraging free self-expression by pupils, and (3) a type of school organization wherein pupils have the chance to speak or write.

The general organization of the monograph is simple, functional, and effective. Three general topics are discussed: (1) life situations in which language is used, (2) ultimate outcomes in English, and (3) how to attain desirable outcomes in elementary language. Each of these is discussed practically, and at length, with the result that the teacher should have an understanding of the problem. For each grade the following divisions are treated in a similarly helpful manner: (1) outcomes to be attained by end of grade, (2) some situations likely to arise which afford opportunities for language activities, and (3) illustrative lessons.

A striking feature of the course of study is the emphasis upon positive achievements in the use of English as a medium of expression rather than upon correction of errors and upon mechanical exactness of written forms. This change is noteworthy. Teachers are prone to defeat the major value of language, that is, fluent, effective self-expression, by constantly directing attention to errors and to correctness in minor details.

The illustrative lessons furnish the teacher many samples. The result of these, it would seem, would be to stimulate a selection, a combination, or an adaptation, rather than a repetition of these procedures. The situations, listed as likely to arise and afford opportunities for language activities, seem somewhat formal. Note the following taken from elementary science and proposed for the third grade:

Why is the cottonwood tree provided with cotton balls?

How can one tell how much a tree has grown during the summer?

Why are toads and frogs called friends of the garden?

How can a boy attract birds to his home?

How I made my bird house.

Why are house flies so dangerous?

What is the best way to rid premises of flies?

A daily weather chart.

What is the best way to clean the snow from the sidewalk?

How can one make a snow shovel?

Of what use are the fallen leaves?

How do plants help to hold moisture?

Why is spring or fall the best time to transplant shrubs?

Approximately a hundred topics, similar to these, are given for this grade. Why so many, when language topics to be vital and effective must be discovered in the day's work or in the child's experience? Such a long list formally arranged would seem to encourage the teacher to select topics from among those rather than to discover them in the activities going on. Doubtless those responsible for the monograph intended these topics to be suggestive, but one is not so informed. Caution here would not have come amiss.

There are some questionable features in the general outline. In the first place, there is little attention to the "creative type of expression." This kind of training is so sadly neglected that special emphasis and treatment are needed. It seems to receive scant attention in the monograph because present life does not provide frequent occasion for its use.[1] Sometimes life, as it is, should not be the standard.

In keeping with this neglect of the creative use of English, which is always individual, one finds such statements as the following: "Desirable outcomes in English are better attained through uniform graded standards in English for all schools and through a strict compliance with these standards in all spoken and written English."[2] To a

[1]Denver, Colorado. *Elementary Language*. Denver, Colorado, Public Schools, 1926, p. 11. (Course of Study Monograph, No. 18)

[2]Op. cit., p. 12.

certain extent, Yes. Always? No. Demanding uniformity in small things destroys originality and frequently effectiveness. For instance, on page 16, we find as an ultimate outcome "Use complete sentences." Many writers of recognized standing and merit do not always use complete sentences, and the effectiveness is increased thereby.

Some of the outcomes are of doubtful value. On page 15, one is told the child is to use "live verbs." What are they? On page 16, the outcomes are given not in terms of quality of voice but in terms of organ control, namely, "Breathe from the diaphragm and support the tone with the breath." What assistance will this give to the average teacher? On page 18, the course of study descends to the level of unimportant detail. The teacher is advised to see that the child attains ability to speak over the telephone. Detailed directions are given:

> Keep the lips about one inch from the mouthpiece and speak slowly, clearly, and directly into the telephone.
>
> Listen carefully while the operator repeats the number and say "right" if she repeats it correctly, "no" if she repeats it incorrectly.
>
> Answer telephone calls courteously.
>
> Announce the number when answering a residence telephone.
>
> Give the name of the company and the department in answering a business telephone.
>
> Keep telephone conversations brief.
>
> Be discreet, avoiding intimate conversations over the telephone.

One would gather from this that special attention should be given to each occasion during which language is used and in each connection the specific verbal response and other features of conduct are to be determined and taught. Why dictate what specific reply a person shall make when the operator repeats the number? Is there no room for intelligence? To reduce objectives to the level of specific words in specific situations is little short of absurd. Suppose these responses had been decreed as an objective in Columbus last year. What a dilemma a teacher would be in this month, since the telephone company has ordered its operators to cease repeating numbers. Another curriculum committee would have to be created to determine specific objectives anew.

The monograph called *Arithmetic* was published in 1924, two years before those for language and the social sciences. In general it is much inferior. This may be due to the fact that arithmetic is more difficult to adjust to modern principles of teaching; to the status of curricular thinking in Denver at the time; or to the more conservative attitudes of those responsible for arithmetic. The monograph states that while the initial motivating force may be found in the child's actual need for number, "these needs cannot of themselves actuate the entire course, for the normal child has need of but a small fraction of the arithmetic which is by common consent regarded as necessary in the school curriculum, therefore other motivating forces must be supplied."[1]

Here the issue is clearly drawn. While the committee goes far in casting out much useless traditional content, they still retain some material useless to the child as a child. Instead of courageously limiting the offering to what is now needed in the present school, or courageously demanding a school life of such a nature that need for necessary arithmetic will naturally arise, they are content to accept the content of the school and curriculum as it is and resort to devices and games.

As a result, the monograph contains abundant suggestions for artificially "stimulating" learning. A comparison, of the artificial nature of the work in arithmetic with the over-supply of natural occasions for using and mastering language, reveals that ours is a talking or writing school rather than a place of activity with things. For it is quite

---

[1]Denver, Colorado, *Arithmetic* (Elementary School, Grades I, II, III, IV, V, VI) Denver, Colorado, Public Schools, 1924. p. 9. (Course of Study Monograph, No. 4)

possible—others have done it—to create an elementary school where the practical arts have a large place and in which the child does find need for all the number the elementary-school demands of him. Without doubt, the schools of the future will be as natural a place, even for the learning of arithmetic, as the better schools now are for mastering language.

Far more space is given to a discussion of educational values in arithmetic, major principles, and general methods of procedure than is usually found. This is quite impressive, and the effort is to be greatly commended. Closer analysis reveals, however, that the authors, instead of determining for themselves the guiding principles and practices for arithmetic, have been content to quote at length—and disconnectedly—from dozens of writers on arithmetic. On page 147, for example, five different authorities are quoted. Such dependence upon scattered quotations is a weakness; the committee evidently lacked confidence in its own conclusions.

The quality of the major purposes, on page 9, rises little above the level of a ready and automatic control of arithmetical operations. In the introduction to the work for fifth and sixth grades, one finds the same limited purposes. There is great need for stressing the development of interests, attitudes, and our understanding of a more fundamental sort than is sought by the usual work in arithmetic.[1]

In treating the detailed phases of arithmetic the monograph is generous. The suggestions for seat work, number games, drill devices, effective use of testing, practical problems, proper methods to use in developing certain principles, and the proper order for taking up new features, are so full and explicit that the monograph will serve as a mine of information for the busy teacher.

In treating these many details the monograph shows varying merit. The work in fundamentals is carefully graded; one new step is introduced at a time. Furthermore, the teacher is cautioned to teach the 1,325 combinations instead of the previously listed 180. There are many processes in arithmetic with which the child has special difficulty. On these the monograph gives help. It is difficult, for instance, in teaching fractions, to make it seem right to the child to divide one number by another and have a larger number for the quotient. In this particular, the monograph gives the rules of Thorndike.[2]

In several instances clarity is lacking. On page 191, under "Ratio" the following rule is given, "The ratio of one number to another is the quotient of the first divided by the second." The statement would have been made more understandable by adding "which results from" after "quotient."[3] We find the following heading, "Subtraction of numbers of two digits without 'carrying,' the term carrying to be used instead of 'borrowing.'" To illustrate this the monograph gives the following example which does not fit the topic:

$$\begin{array}{r} 95c \\ 58c \\ \hline 37c \end{array}$$

There are a great many debatable questions concerning the proper method of handling the detailed processes in arithmetic. The schools of a system may find it necessary to follow some one plan; again, they may not. Even though one plan is accepted, the teacher should be made aware of its tentative, uncertain nature and, whenever possible in such cases, freedom to choose either of two equally good methods should be permitted. This the monograph does not do. The authors recognize that

[1] See Hamilton, E. R. "Insight and Skill in Arithmetic," *Journal of Educational Research*, 12:136–44, September, 1925.

[2] Denver, Colorado. *Op. cit.*, p. 177.

[3] *Ibid.*, p. 68.

some of the procedures may be new to some teachers and may be questioned. In this case, the authors claim the support of modern psychology and ward off criticism by saying, "when new ideas are presented the most important thing is not to agree with them, nor to oppose them but to understand them."[1]

In their advice on methods to follow the authors are not always sound. On page 68, they authoritatively advise the additive method of subtraction and "carrying" rather than "borrowing." Such practice is not supported by evidence. And even though it might be a more effective method of securing accuracy and speed in subtraction, from the standpoint of meaning and insight it seems quite evidently inferior.

On the whole, however, the shortcomings of these monographs, when compared with the usual courses of study, are small indeed. Denver is to be distinctly commended for its product. Anyone concerned in improving the curriculum of the elementary school will be amply repaid by a careful study of this material.

THE DENVER COURSE OF STUDY IN SECONDARY EDUCATION

V. T. THAYER
Ohio State University

FOR the past four years or so the city of Denver has been engaged in the work of curriculum revision. The courses of study thus far published in the field of secondary education[2] indicate clearly that Denver will exercise a profound influence upon secondary-school practice. It has perfected an organization which will serve as an example for other cities, and it has demonstrated how this organization can function to vitalize existing courses of study and teaching methods.

The Denver organization provides for a permanent department of curriculum revision under the direction of an assistant superintendent. Thus far this department functions through "three sets of committees in each subject-matter field; one each for elementary schools, junior high schools, and senior high schools. Coordination is effected through joint meetings and supervision." There are in addition three central committees, one on "constants" for junior and senior high schools, one on the organization of the program of studies in junior and senior high schools, and one on the administration of educational and vocational guidance. In so far as possible, the committees are composed of classroom teachers—directors, supervisors, and principals, serving as ex officio members—and an effort has been made to have all parts of the system represented, so that the teachers who thus serve on committees may maintain an intimate relationship between committee activity and the teachers and principals of each school in the city. Teachers who are engaged in committee work are freed from class work for this purpose. Finally, outside experts in secondary education have been called in to consult and advise with committees.

In Denver change is permanently provided for. No course of study is considered final and the curriculum organization is designed to perpetuate alterations. Despite this fact, it is

[1] *Ibid.*, p. 10.

[2] The writer has before him the course of study monographs in Latin for the junior high school, French, Spanish, Mathematics for junior high school, English, Home Economics, General Science for Grades VII and VIII, Biology, Commerce, Art, and Social Science.

possible from the courses of study thus far published to detect the stride into which revision is falling.

The Denver procedure indicates a swing away from the tendency so prominent in recent years to begin curriculum revision with a few large objectives and to divide these indefinitely into smaller objectives. As Superintendent Newlon has said:

> We steadfastly refused to lay down a set of principles to guide committees in their work or to express our opinions as to what were the particular objectives to be attained in particular courses. On the other hand, we took the position that every committee should begin by making a survey of the writings, the experimentation, the practice, the controversies, and the unsolved problems of its field.

The results of this approach are manifest in the courses thus far printed. We look in vain for minute objectives, but we find without difficulty a minute and detailed application of a few central objectives. The result is a course of study which becomes an invaluable manual for teachers, an indispensable reference book, and a suggestive source for varied teaching procedures.

Take, for example, the social studies in the senior high school. This course provides for world history in the tenth grade, American history and government in the eleventh grade, and an elective course in American problems for the twelfth grade. Each of these fields of subject-matter is divided into units, and each unit is planned to occupy a student's time for several weeks. These units, however, are not stated in terms of ground-to-be-covered, but are outlined in such a way as to assist teachers in planning pupil activities. Each unit is thus a *teaching unit* and its description includes such items as, a brief presentation and suggestions to teachers, "things to think about," or suggested topics for class discussion, references for a preview, the pupil's first reading for the unit, map work, a guidance outline for teachers designed to assist the teacher to secure an enriched background for the unit, standards of attainment to be expected of pupils, references and suggested readings, etc. Such a course of study manifestly becomes an indispensable aid to the teacher and enables him to use his textbook for the realization of educational ends rather than as an end in itself.

Moreover, as one looks through these courses of study and notes their date of publication, he will observe a progressive refinement in the technique of building a course of study. For example, the objectives in foreign language teaching are essentially the same, but the Latin course for the junior high school, printed in 1924, lacks the refinement of procedure revealed in the construction of the French and the Spanish courses of study. There is agreement in each case upon teaching the language so as to develop a "language sense," but the latter courses of study—French and Spanish—succeed much better in translating this objective into classroom procedure. While the Latin course of study contains a wealth of suggestive material, it is more characteristically a course of study in the traditional sense of ground-to-be-covered.

As stated above, Denver has called in experts to work with the committees, and the hands of these experts are easily detected in the products. Thus, Professor Raleigh Schorling can be seen in the mathematics of the junior high school, Professor H. O. Rugg, R. M. Tryon, and Howard C. Hill in the social-studies course, and W. W. Charters is discernible in home economics. This may influence one's attitude towards a specific course of study accordingly as he accepts or rejects the views of these experts. However, the particular content and method ex-

emplified is irrelevant to the much more significant fact that we have revealed a method of curriculum construction in which the advanced thinking of specialists can be brought directly to teachers and worked over by teachers so as to facilitate the introduction of new methods of teaching.

The Denver course of study committees have served their city well, and in so doing they will stimulate progressive educational thinking in the country at large. Every teacher and supervisor should welcome this opportunity to study his own problems in the light of the Denver procedure.

EDUCATIONAL READINGS

BENNETT, J. C. *A Study of Pupil Errors in Chemistry*, *JER*, 14:275–83, November, 1926.

This is the report of an extensive cooperative study in the use of a well-known chemistry test. As usual, the results of the tests were very disheartening to those who gave the tests. The answers to several of the questions are presented in detail to illustrate common errors.

ULLRICH, OSCAR A. *The Effect of Required Themes on Learning*, *JER*, 14:294–303, November, 1926.

The experiment was very carefully conducted and most of the variable factors seem to have been eliminated as nearly as possible in such a study. There is a very slight advantage in favor of the required themes, but whether it is great enough to pay for the time and effort on the part of student and instructor is still an open question.

MCCONATHY, OSBOURNE. *Public-School Music*, *JER*, 14:284–93, November, 1926.

The art of music is yielding more and more to the rigors of scientific method. After careful testing, the upper-grade children are divided into three groups, one for music appreciation only, one for music appreciation and singing, and one for instruction in instrumental music, as well as in music appreciation and singing. Differentiated courses are arranged, and the results seem to justify the effort.

KITSON, HARRY DEXTER. *Relation between Age and Promotion of University Professors*, *S&S*, 24:400–404, September 25, 1926.

Dr. Kitson presents data showing the age at which 176 Chicago professors and 165 Columbia professors began their university careers, the number of years they remained in various stages of promotion, the age at which they attained their present rank, and the academic degrees held by them. Among other things, he finds that the men professors at Columbia became professors at the age of forty while the rank of professor was not reached by the men at Chicago until the age of forty-four, and that the eight women professors at Columbia and the seven women professors at Chicago became professors at the ages of forty-seven and fifty-three years, respectively. Of the Columbia professors, 60 percent went there as associate professor or professor, while at Chicago only 40 percent came from other institutions. Dr. Kitson says, "To a young man who contemplates entering the vocation of university professor these figures enable us to give positive information that will help him in planning his career." They might prove interesting and useful to others, as well.

SEVERANCE, HENRY O. *Magazines Which High-School Pupils Read*, *SR*, 34:587–90, October, 1926.

This article reports a study of required and voluntary reading of pupils in junior-senior high schools of three towns in Missouri. The results are quite similar to results which have been found by other investigators. The *American Boy*, *American Magazine*, *Boy's Life*, and *Popular Mechanics* were the most popular among the boys, and the *American Magazine*, *American Boy*, *Ladies' Home Journal*, and *Saturday Evening Post* were the most read by girls of the junior high schools. The study by Jordan of the University of North Carolina shows *American Boy* and *Popular Mechanics* to rank the two highest for boys of this age, while with girls the *Ladies' Home Journal* stands first. In the senior high school the *Saturday Evening Post*, *American Magazine*, *Western Stories*, and *American Boy* stood highest with boys, and *American Magazine*, *Ladies' Home Journal*, *Cosmopolitan*, and *Saturday Evening Post* stood highest with girls. The article concludes with a table showing magazines read most frequently by University of Missouri students. The *Saturday Evening Post* and *American Magazine* top the list.

NOTE.—The abbreviations used in this number are: *JER*, Journal of Educational Research; *S&S*, School and Society; *SR*, School Review; *AE*, American Education; and *ASBJ*, American School Board Journal.

SHEPHERD, EDITH E. *The Attitude of Junior High-School Pupils toward English Usage*, *SR*, 34:574–86, October, 1926.

The writer reports the results of an experiment in teaching English usage to seventh-grade pupils with respect to influence on pupils' attitudes. A rather careful classification of the pupils shows them to be divided into four groups: those having attitude for real learning, some lesson learning with much real learning, lesson learning dominant, and problem cases. The percent of pupils in the four classes in two successive years shows a pleasing increase in the proportion of children who get out of the "lesson-learning-dominant" group. The writer concludes that "individualization of instruction, emphasis on pupil responsibility, cooperation of the various departments in holding pupils to good standards of usage, and, above all, more refined recognition of the nature of the objectives are important factors in establishing desirable attitudes on the part of pupils."

KIDD, DONALD M. AND CLEM, O. M. *The Salaries of Superintendents of Schools and Mayors in Cities of 100,000 Population and Over*, *ASBJ*, 73:51–52, October, 1926.

This is a continuation of a study reported in part in the September number. The influence of geographical location, the effect of fiscal independence and the effort of commission or council-manager types of city government are presented.

ELLIS, ROBERT S. *The Correction of Constant Errors in College Marks*, *S&S*, 24:432–36, October 2, 1926.

The writer states that the purpose of the paper is: "first, to present some statistical data on variations in marks between different instructors and different departments when psychological test scores and averages of marks made in the freshman year by members in the different classes are used as standards, and second, to suggest a method of using these standards so as to make it possible to reduce materially the average differences in level between the marks given by different instructors." The writer works out a scheme which he believes will accomplish this purpose and shows clearly how to apply his method to the individual class.

HURD, A. W. *A Suggested Technique for Selecting High-School Pupils Who May Be Allowed to Plan Their Own Lesson Assignments*, *SR*, 34:618–26, October, 1926.

The data were obtained in a course of high-school physics, and the object was to discover, if possible, what work pupils would do in such a subject as "heat" if allowed to follow their own plans freely. Mental tests, tests covering the subject, teachers' marks in all previous school subjects, and marks in industry given by previous teachers were used. The writer concludes that no one of these factors can be depended upon alone to designate accurately the pupils who should be allowed to plan their own lesson assignments. All factors except chronological age were effective with the group study. Rating in the previous term's work in the same subject stood first, and teachers' marks in all school subjects last. The article is highly suggestive to teachers of initiative who wish to develop self-reliance in their pupils.

VOSE, JAMES W., AND CHEEVER, J. P. *A Self-Rating Score Card for High-School Principals*, *AE*, 30:6–10, October, 1926.

The score card is intended to assist school principals to analyze themselves under the following heads: (1) Relations to the profession; (2) Relations to higher school-administration groups; (3) Relations to high-school management; (4) Relations to teachers; (5) Relations to pupils; (6) Relations to school plant; (7) Relations to community; and (8) Relations to self. Provision is made for checking one's standing in terms of A, B, and C values on each of the subitems of these various heads.

IN PAPER COVERS

MONROE, WALTER S. AND CLARK, JOHN A. *The Teacher's Responsibility for Devising Learning Exercises in Arithmetic*. Urbana, Illinois, University of Illinois, 1926. 92 pp. (University of Illinois Bulletin, Vol. XXIII, No. 41, Educational Research Series, No. 31)

This is a technical monograph reviewing many of the findings in the psychology of arithmetic. The conclusion is that "usually it will be necessary for the teacher of arithmetic to devise some exercises to provide perceptual experiences." He "is responsible for discovering the 'gaps' in the adopted text and for devising the exercises necessary to round out the practice." The teacher will, however, have a hard time understanding and applying the principles presented in this bulletin.

PITTSBURGH, UNIVERSITY OF. *Looking Inside the School*. Pittsburgh, Pennsylvania, N.D. 73 pp. (Series of Eight Radio Talks, Radio Publication No. 22,)

Colleges and universities have not been slow to avail themselves of the radio as a means of reaching a larger audience. The University of Pittsburgh has gone even farther in that they have put eight radio talks on "Looking Inside the School" in print, for still distribution. Each of the eight talks deals with some phase of school work, from "How Do Children Learn" to "How the State Aids the Local School."

BALTIMORE, CITY OF. *Geography: Course of Study for Junior High Schools.* Baltimore, Maryland, Division of Secondary Education, 1926. 344 pp.

This is a course of study which is a real contribution in its field—the result of two years of experimental teaching, prepared by a committee of Baltimore geography teachers with the advice of twelve "notable geographers and educational experts." The seventh grade will study foods, fuel and power, shelter, clothing, and tools; the eighth grade will study luxuries, recreation, production, transportation, and consumption. Most of the 344 pages are taken up with such things as objectives, outcomes, minimum attainments, activities, materials, bibliographies, and practice and achievement tests. An original play, entitled *As the World Goes Round*, is included in the book. We are promised later publications giving the "conclusions from several experiments still going forward in the department."

INDIANA UNIVERSITY. *High-School Principals Conference*, Bloomington, Indiana. 1925. 77 pp. (School of Education Bulletin, Vol. 2, No. 2)

The ten addresses given at the meeting have been printed in this bulletin. A diversity of subjects was presented, ranging from standard tests to the administration of athletic funds. Dr. Ashbaugh gave a series of three addresses on (1) Achievement Tests in High Schools, (2) Senior High-School English as Revealed by a Standard Test, and (3) Senior High-School English as Revealed by Letters.

BOOKS TO READ

WOOLLEY, HELEN THOMPSON. *An Experimental Study of Children at Work and in School between the Ages of Fourteen and Eighteen Years.* New York, Macmillan Company, 1926. xv+762 pp.

The vocational guidance counsellor, the juvenile court examiner, or any clinician whose chief interest is the adolescent boy or girl will find useful this statistical record of a series of annual retests. The first tests—physical and mental—were given to 753 working children of fourteen or fifteen years of age and a similar group of school children. Annual retests were given to the available members of each group until their eighteenth birthdays. A variety of comparisons between the two groups is recorded. The final chapter concludes with a series of suggestions in which the problems of school leaving are discussed in relation to the age of compulsory attendance, special provision for indigent but superior pupils, educational diagnosis, and vocational training and guidance.

Psychologies of 1925. (Powell Lectures in Psychological Theory) Worcester, Massachusetts, Clark University, 1926. 412 pp.

Nineteen lectures on special phases of contemporary theoretical psychology are given by seven American and two German psychologists in *Psychologies of 1925.* The lecturers are: Madison Bentley, Knight Dunlap, Walter S. Hunter, Wolfgang Koehler, Kurt Koffka, William MacDougall, Morton Prince, John B. Watson, and Robert S. Woodworth. Three-fourths of the lectures are well worth a careful reading. The rest are, for the most part, rather weak logical attacks upon imperfectly grasped opposing points of view.

The book is claimed by its editor to give a true "cross-section of contemporary theoretical psychology," which is debatable of accomplishment in such brief compass. It does, however, indicate the direction in which psychological theory is moving. Educators will certainly find it stimulating.

DOUGLAS, HARL R. *Modern Methods in High-School Teaching.* Boston, Massachusetts, Houghton Mifflin Company, 1926, xviii+544 pp.

This book discusses not only the conventional topics of questioning, assignments, planning, quizzes, marks, and examinations, but also the so-called "new methods" of teaching, such as supervised study, visual instruction, socialized recitation, and the project and problem methods. To the consideration of these methods of teaching is added a treatment of standardized tests, new type examinations, and controlled classroom experimentation, which is designed particularly for teachers untrained either in administering tests or in statistical methods. Not the least of the book's virtues is the comprehensive bibliography following each chapter.

LA SALLE, DOROTHY. *Play Activities for Elementary Schools.* New York, A. S. Barnes and Company, 1926. 179 pp.

The purpose of every physical education program should be "to develop the spirit of fair play, good sportsmanship, the ability to take defeat gracefully and manfully, and to realize that victory is won not by luck, but by hard work, and that great victories are won only by those with clean, healthy minds and bodies." Such has been the author's idea in outlining the course of study given in her book. More than 150 games for grades I-VIII, with directions on how to play them, comprise the majority of material in the book. Under "Criteria for Judging Results," is given a detailed outline which should be of value in the organization or reorganization of gymnasium work in any school. The outline is so worded that questions may be answered by "yes" or "no."

NEW TESTS

The Columbia Research Bureau Tests, prepared for high-school and college students, now include Tests in English, French, German, Spanish, plane geometry, and physics. Tests in other subjects are in preparation. Dr. Ben D. Wood, director of the Bureau of Collegiate Research, at Columbia University, has collaborated with specialists in the particular subject in devising each test. All the tests have been used in provisional form, and, through the findings of this experimental period, the final forms of each test have been arranged so that the validity and reliability of each test are high.

The scheme of scoring is objective and is so simple that it can be done quite quickly. Two equivalent forms of each test have been prepared. This series of tests is published by the World Book Company, Yonkers, New York.

The English Test will be described in detail as representative of the series. Dr. Harrison R. Steeves and Dr. Allan Abbott of the Department of English at Columbia have collaborated with Dr. Wood in the preparation of this test which includes the four requisites in English, namely, "spelling; the mechanics of English, including punctuation; vocabulary; and literary knowledge." Norms, based upon the scores of more than one thousand college Freshmen, are given in the Manual of Directions, and key forms to use in marking the test papers are also provided.

We have recently received from E. C. Witham, director of the Department of Research, Wilmington, Delaware, a grade and progress sheet to be used in September and February. The sheet is divided off into half-grades along the horizontal axis and half-years in school on the vertical axis. The significant feature of the sheet is the interpretation of various number of years, rapid or slow, which are printed on diagonal lines on the face of the sheet. Following are direct quotations: One and one-half years rapid, near genius—enrich curriculum; one year rapid, very bright—danger of wasting time on fundamentals; one-half-year slow—double promotion whenever possible; one year slow, danger line—individual instruction; one and one-half years slow—drill on fundamentals; two years slow—vocational try-outs; two and one-half years slow—border line cases; three years slow—ungraded classes; three and one-half years slow—probably feeble-minded. Mr. Witham says "The big thing about this chart as I see it is that it starts the teachers doing something about the 'failures' or 'repeaters' or 'over-age' pupils under their care. They know without the chart that they have retarded pupils, but they are complacent about it. After making up one of these charts the teacher wants to do something about her retardations right away." Any device which removes teacher complacency is probably of value. The first stimulation, it seems to me, should be toward ascertaining causes rather than immediate classification. Doubtless such an effect may be secured with this sheet with a moderate degree of supervision.

The National Bureau for the Advancement of Music has published a 48-page booklet, *State and National School Band Contests*, describing the progress of the school band contest movement and outlining the plans for this year's national contest. Instrumentation, points to be judged, a sample of the judge's score card, a list of the selections to be played, means of arousing local interest and financial support, and a brief summary of state contests are presented. Further information may be procured from the Committee on Instrumental Affairs of the Music Supervisor's National Conference, 45 W. 45th Street, New York City.